



* Celebration of the Successful Launch of Delta-76

After the
Launch of
ITOS-1 and
Australis-OSCAR-5

February 11, 1970

Jan A. King
AMSAT AO-5 Project Mgr.

Revision 2.2



* The Trends and the Times -1970



- * The Delta Launch Vehicle is becoming known as the “Workhorse” of the Launch Vehicle “Industry.”
- * NASA has taken Over LC-75 from USAF and Renamed it SLC-2E and SLC-2W. Delta Uses SLC-2W.
- * The Delta Program Office is Firmly Fixed at NASA’s Goddard Space Flight Center (NASA/GSFC)
- * Delta is Changing Fast - Every few Launches there are Configuration Changes to the Vehicle
- * Delta’s Success Rate Remains above 92%
- * Delta Has Launched All of the Prior, First Generation, TIROS Weather Satellites.

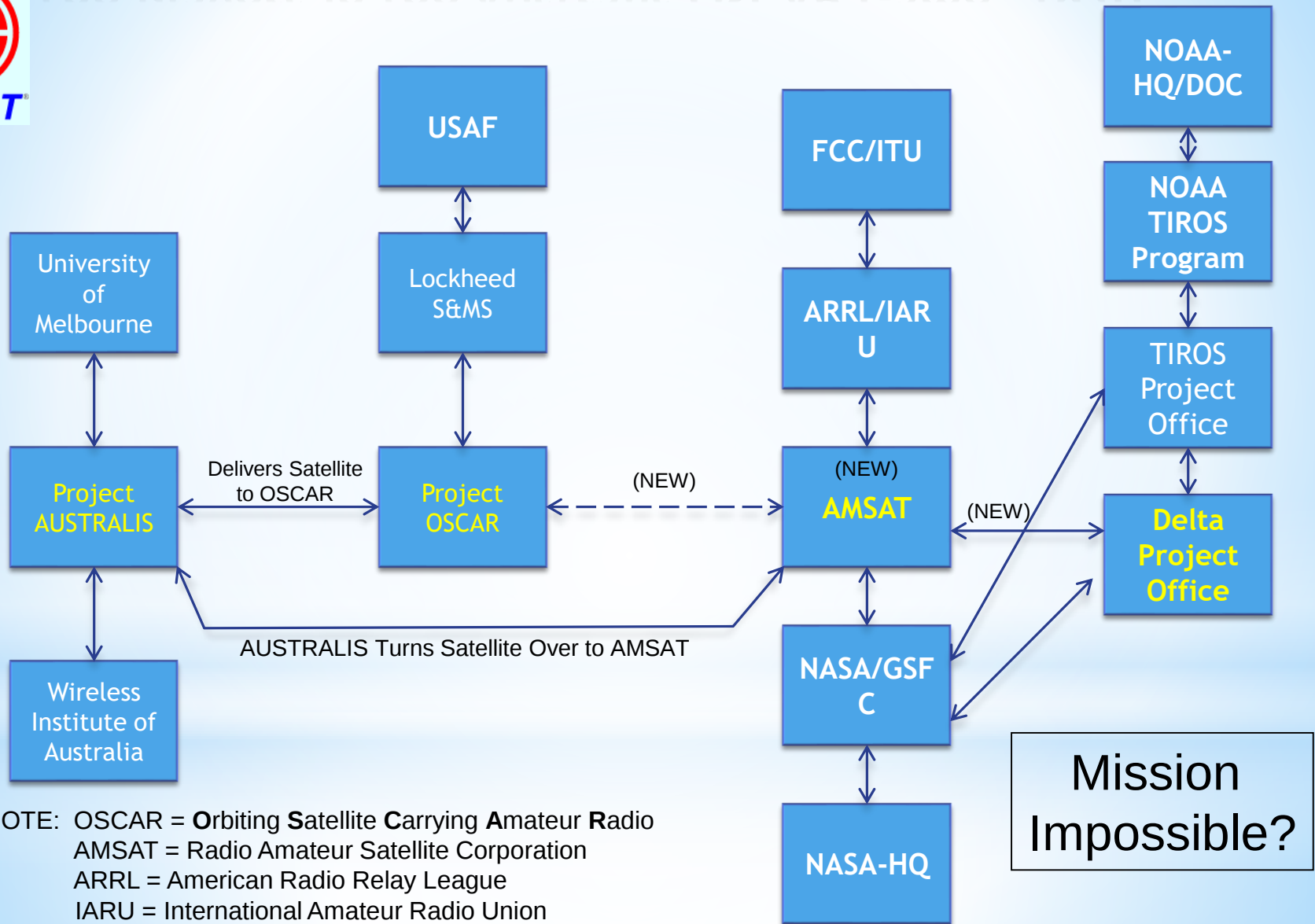
* The Trends and the Times -1970



- * The U.S. Weather Satellite System has just been moved from NASA to what is soon to become NOAA. (It was ESSA at that time.)
- * TIROS (Television and Infra-Red Operational Satellite) is working on their Second Generation (much more expensive) Satellites
- * The First of These New Satellites is Called TIROS-M on the ground and is to be ITOS-1 on-Orbit.
- * ITOS = Improved TIROS Operational System (note double acronym)
- * TIROS-M is a vastly improved technology platform intended to prove-out the first space-based OPERATIONAL Meteorological Forecasting System.



* The Players in the Australis OSCAR Game -1970



NOTE: OSCAR = **O**rbiting **S**atellite **C**arrying **A**mateur **R**adio
 AMSAT = Radio Amateur Satellite Corporation
 ARRL = American Radio Relay League
 IARU = International Amateur Radio Union
 FCC = (US Federal Communications Commission
 ITU = International Telecommunications Union

Mission Impossible?

* What NASA and NOAA Hadn't Counted On:

* 1) The Sheer Determination of the Delta Project Office When They Wanted to Get Something Done. AND....

* 2) The AMATEUR RADIO MAFIOSO:

* Sort of Like the Free Masons; A Brotherhood; We had Members Imbedded Everywhere

* AMSAT had Members at High Levels Inside:

* NASA/GSFC - Center Director, Dr. Clark was a Radio Amateur (W3GYU)

* NASA/HQ - Dick Daniels at NASA/HQ not only helped refurbish the satellite he walked the paperwork through to the NASA Administrator's Desk for Signature

* NOAA/ - Jack Townsend, Head of NOAA Meteorological Satellite Programs was a Radio Amateur (W3PRB)

* FCC - Multiple Radio "Hams" on the Staff, including Art Feller in Citizens and Amateur Division who was also AMSAT's Treasurer

* Not to mention "plants" within: Dept. of State, Dept. of Commerce, USIA, USAF, Lockheed, Douglas AC, IBM, APL/JHU, JPL, Comsat, Intelsat, the ITU, etc.

* It Helped, Immeasurably, that Project OSCAR had Gone Before Us



* The DELTA Game (1969 - 1970):

* Project Australis: Mates, this has been a lot of work.

We want to **See Our Spacecraft Fly!**



* AMSAT: We just put together this Incredible Organization. We want to Provide Amateur Radio Satellites (with Student Involvement) - FOREVER. BTW, we Think we're Smart.

* Delta Project:

- * We want to make DELTA available to Everyone - and Everywhere
- * Every Chance we Get We Improve the Rocket A.S.A.P.
- * Secondary Payloads are Important
- * International Customers are Important

* NOAA/TIROS/ITOS:

- * Satellites NOW Greatly Improve Weather Forecasting
- * We're Ready to Provide Global Data via Satellite to Change WX Prediction Forever. But, we don't want to Falter on this Next Step in the Program.
- * DELTA wants to Improve the Rocket for TIROS-M/ITOS-1 more than is Necessary for **Our** Needs and This Increases **Our** Probability of a Failure.
- * DELTA wants to Fly a Secondary Payload with TIROS-M; This Increases the Probability of a Failure for **Us**.

* Game ON (1969 - 1970) (#1)

- * Australis Satellite is sitting in Lance Ginner's (Project OSCAR PM) Garage. Project OSCAR having trouble getting USAF Approval for Launch. The Classified CORONA Program is Finishing Up.
- * AMSAT Requests that Australis be Transferred from OSCAR to AMSAT
- * AMSAT Informally Requests a Secondary Launch from Delta Project
- * AMSAT Formally Requests a Secondary Launch from NASA-HQ
- * AMSAT Files for Radio License for Satellite with FCC and ITU
- * Delta Project Office Offers Assistance and Agrees to Design the Separation System Interface if AMSAT will Fabricate It.
- * Project Australis Authorizes the AO Spacecraft to be Sent to AMSAT.
- * AMSAT's Jan King and Delta's John Tomasello have the first meeting with the ITOS Project Manager (at GSFC). His name was Bill Jones.
- * Bill Jones, having heard the presentation by King, says he has three answers regarding the AMSAT request: . . .



* Game ON (1969 - 1970) (#1)



* No

* Hell No

* And, Never . . .

* Bill says we can choose between these options.

* Game ON (1969 - 1970) (#2):



- * AMSAT's Dick Daniels and Perry Klein Obtain Approval Signature of the Deputy Associate Administrator for Space Science of NASA:

Dr. Richard Marsten

- * Delta Project Office Requests Vehicle Contractor, Douglas Aircraft to Modify Delta to Incorporate a 2nd Payload in the Aft End of the Delta-M6. 2nd Stage. **NOTE:** We think this is a bit before the NASA-HQ signatory letters were actually received at GSFC.
- * AMSAT, with the help of Dr. Marsten, persuade the Administrator of NASA, Dr. Thomas Paine, to sign a letter authorizing the launch of Australis OSCAR-A ("A" to be "5" after launch). This is provisional, pending the approval of NOAA (ESSA?) TIROS Program Office. The launch is FREE to AMSAT.
- * NOAA Head of Satellite Programs, Jack Townsend Agrees, Conditionally, to Launch the Spacecraft (remember, he's a ham). There is a long list of provisos. It means AMSAT (with the help of Delta) has lots of testing and report writing to do.
- * AMSAT Refurbishes Australis Spacecraft, Replaces Battery, Builds Separation System to DELTA Specifications, and Environmentally Tests Spacecraft (not the least of which was a BRUTAL Vibration Test).



* Game ON (1969 - 1970) (#3):

- * AMSAT and DELTA Complete the List of Constraints put forward by NOAA, clearing the way for Integration of the Satellite.
- * ITOS Project Office Reluctantly Agrees to Fly Australis OSCAR-A, clearing the way for the Launch of the:
 - * First International Secondary Payload Launched by United States (Only about the 5th International spacecraft ever)
 - * First EDUCATIONAL SATELLITE Ever Built and Launched by University Students
 - * First S/C Ever Built in Australia/2nd Ever Launched (WRESAT Won) [Sort-of]
 - * First Non-Government Secondary Spacecraft Launched by NASA
 - * First Amateur Radio S/C to Execute a Earth-to-space COMMAND
 - * First Officially Licensed Radio Amateur Spacecraft
 - * FCC Licensed
 - * ITU Authorized
- * Australis-OSCAR-A is Approved for Launch at the T-3 Day Launch Readiness Review. ITOS Project Office Concurs. DELTA Project Concurs. Goddard Space Flight Center Director Concurs.
- * **Launch of ITOS-1 and Australis-OSCAR-5 is 100% Successful and Takes Place on 23 January 1970.**
- * Australis-OSCAR-5 Completes it's Mission after 46 Days of Successful Operation.

*The Party...



- * This was a New Era in Weather Forecasting via Satellite
- * This was a New Delta Rocket with 6 Solid Strap-On Rocket Motors
- * The DELTA Team Always Worked Hard ---
 - * But, They Played Even Harder --- So, Let's Party
- * Bob Goss Head of Mission Integration, Planned a Grand Party at the GSFC Recreation Center. The Party was on 11 February 1970.

- * Invited were . . .

* The Party Invitees:



* NASA:

- * Dr. Tomas Paine, Administrator, (Did not Attend)
- * Dr. Richard Marsten, Deputy Associate Administrator for Space Science (Highest Level NASA Attendee)
- * Dr. Len Jaffee, Deputy Associate Administrator for Space Applications (2nd Highest Level NASA Attendee)
- * Dr. John F. Clark, Center Director, GSFC
- * Bill Jones, ITOS Project Manager
- * William Schindler, DELTA Project Manager
- * Charlie Gunn, DELTA Deputy PM Technical
- * Robert J. Goss, Head Mission Integration - *The Moderator for the Evening*
- * The Entire Mission Integration and Analysis Staff of DELTA Project Office

* NOAA:

- * Dr. Jack Townsend, Associate Administrator for Meteorological Satellite Programs
- * NOAA ITOS Program Office (Many, Names Lost)

* AMSAT:

- * Dr. Perry I. Klein, President
- * Jan A. King, AO-5 AMSAT Project Manager
- * Richard Daniels, NASA-HQ Liason Office and AO-5 Mechanical Engineer
- * Harry Helfrich, Satellite Environmental Test Manager

*THE OSCAR



John Tomasello,
A member of the Bob
Goss DELTA Mission Integration
Team, disappeared for a
few days in early February of that
year. He was in the GSFC Machine
Shop, where he fabricated
about Two Dozen of [these](#).

They were presented to
All of the "Luminaries" of
the NASA and NOAA teams.

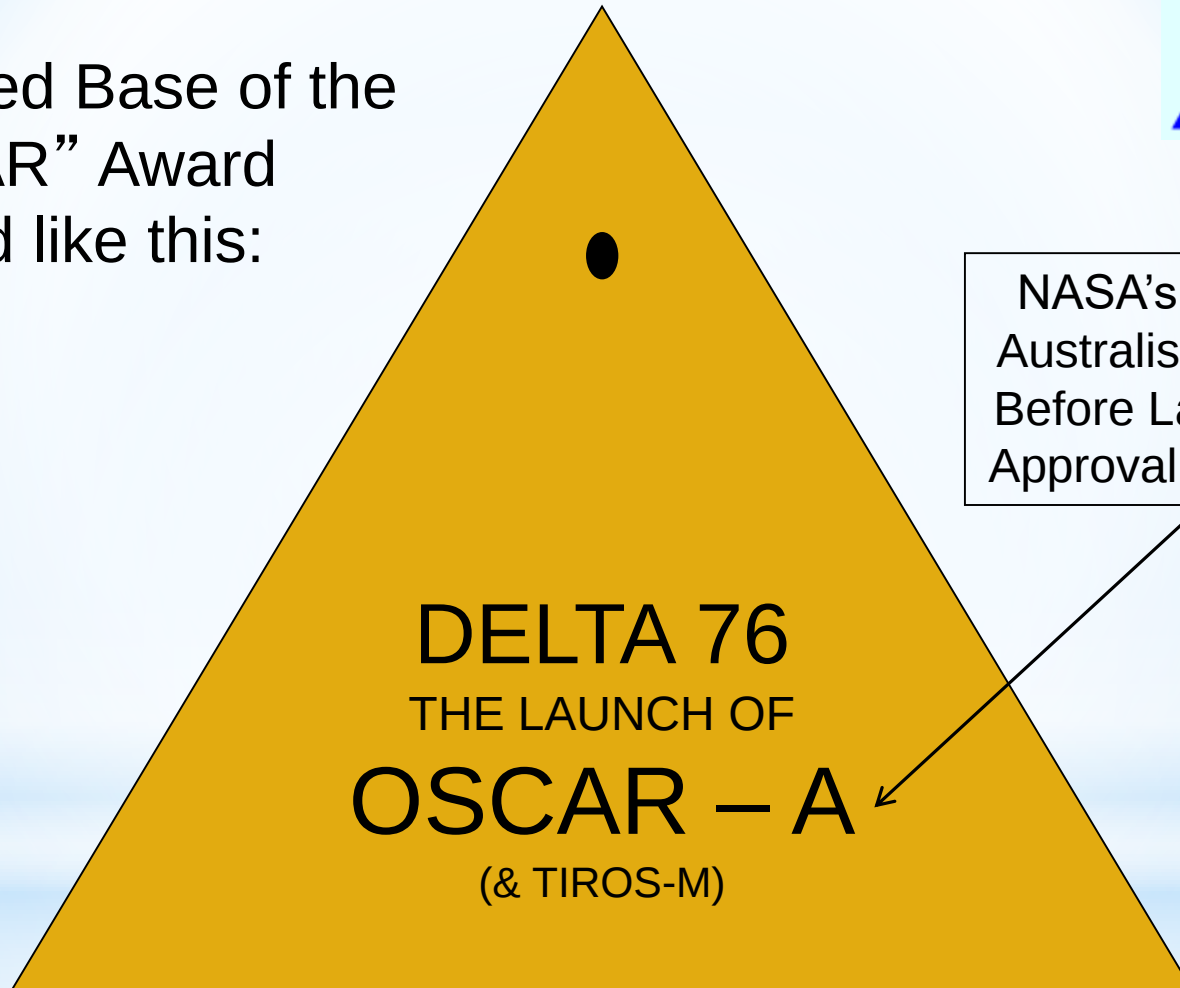
...and to Jan King and Perry Klein
of AMSAT

On the Occasion of the
Australis-OSCAR-5 40th
Launch Anniversary
Jan King presented his
OSCAR to
Richard Tonkin of Project Austalia
where it
Rightfully Belongs for Good.
UNIVERSITY OF MELBORNE
- BE PROUD -

* The OSCAR:



The Engraved Base of the
“OSCAR” Award
Looked like this:



NASA's Name for
Australis-OSCAR-5
Before Launch and
Approval for Launch

John Tomasello, AO-5 Delta Mission Integration Manager, Overseeing Vibration Test of the Next OSCAR



* The Song



- * Robert Goss, Never Wanting to Miss an Opportunity for Social Satire, had Created an Iconic Singing Group (just for such Occasion as this)... It was a Barbershop Quartet.
- * The Name of the Group: The Four Flushers (Yep)
- * Except, there were Five Singing Members:
 - * Bob Goss (program MC himself)
 - * George Baker
 - * Jury Kork
 - * J.D. Craft
 - * Phil Frustace ... and they sang in 5 Part Harmony!
- * While Not Quite Up to Banjo Patterson standards, the song, non-the-less, told the Story of the Prior Year Between TIROS and the Upstart, AUSTRALIS.
- * You've Heard the Tune Before...



A Bicycle Built for Two

By Henry Darce

1892

Daisy, Daisy, give me your answer, do.

I'm half crazy all for the love of you.

It won't be a stylish marriage,

I can't afford a carriage;

But, you'll look sweet upon the seat of a bicycle built for two.

2nd Verse:

Henry Henry, this is my answer true:

I'm not crazy over the likes of you.

If you can't afford a carriage,

Forget about the marriage:

I won't jammed, I won't be crammed on a bicycle built for two!



Robert J. Goss
Head Mission Integration
Delta Project Office
...and my future boss.

This photo was taken on AO-5 Luanch Day (23 January 1970) by Dick Daniels.

AND NOW...

A Vehicle Built for Two



Today Performed by:
Jan A. King

By Robert Goss

Delta Project Office, NASA/GSFC

February 1970

1st Verse: **(Tiros PM to OSCAR PM)**

Bill Jones to Jan King

OSCAR, OSCAR give me your answer, do.

I'm unwilling to share my ride with you.

You'd probably block my vision,

Or cause a space collision.

So, I'll be damned if I'll be crammed

On a vehicle built for two.



2nd Verse: **(OSCAR PM to TIROS PM)** ← *Jan King to Bill Jones*

TIROS, TIROS, here's my reply to you:

I'm approved by N-A-S-A – HQ.

So, don't be unkind or bossy

With this hitch-hikin' Aussie,

And, I'll look neat in the rumble seat

Of a vehicle built for two.



Bill Jones to Bill Schindler

3rd Verse: (TIROS PM to Delta L/V PM)

Delta, Delta, here's all I have to say:

If he bumps me there will be hell to pay.

Six solids we could not prevent,

This ham adds to our torment.

We never thought that we'd get caught

On a vehicle built for two.



Bill Schindler to Bill Jones

4th Verse: (Delta L/V PM to TIROS PM)

TIROS, TIROS, not a thing can go wrong,

Be a hero – let OSCAR tag along.

And be a content precursor,

It could have been much worser –

We could you see, have carried three

On this vehicle built for two.

...AND, as though this little song was foretelling the future...



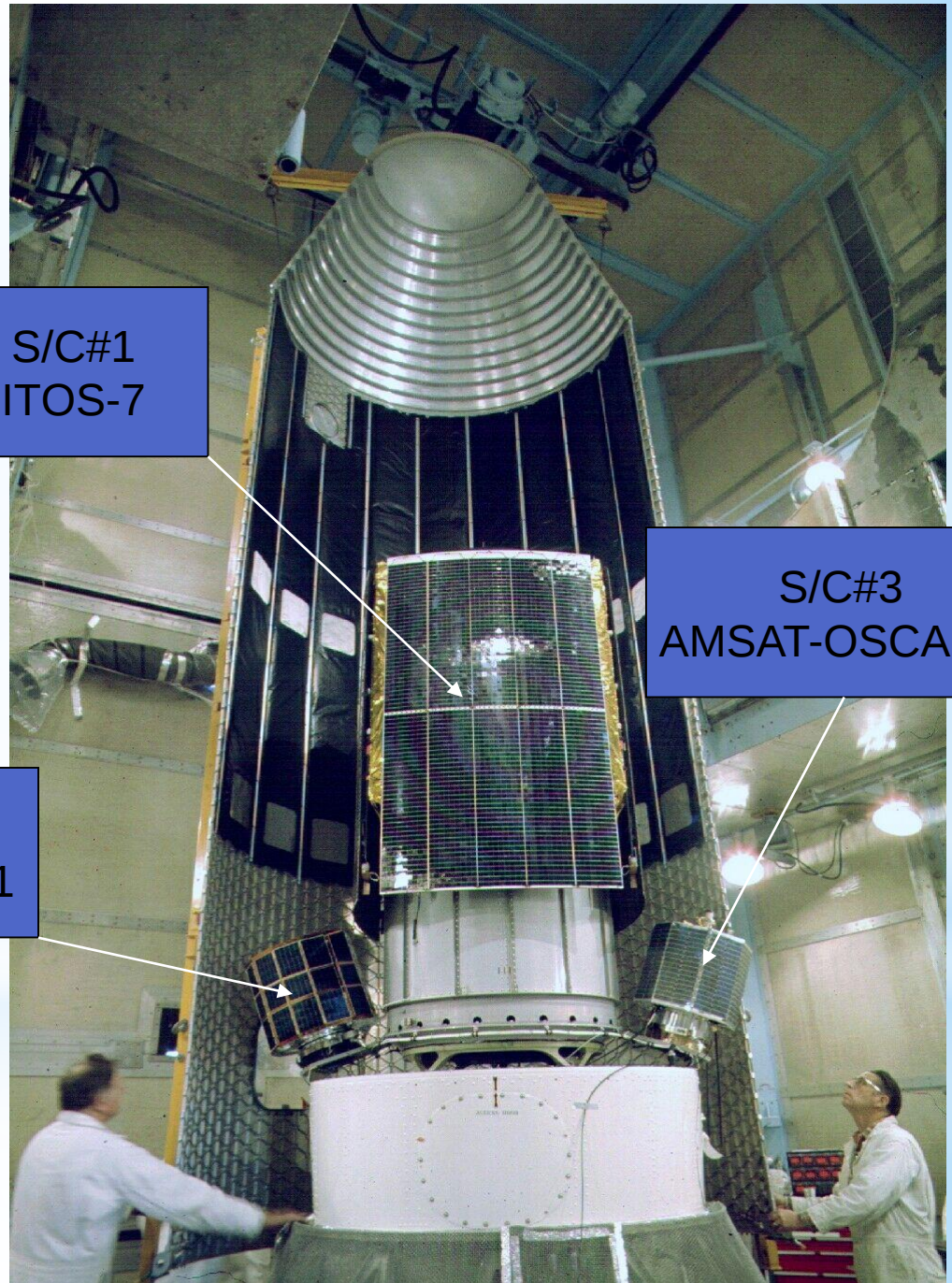
...on A Vehicle Built for **Three** –

- Four Years,
- 28 Delta Rockets,
- 7 ITOS Spacecraft,
- And, Two OSCARs Later:

S/C#1
ITOS-7

S/C#2
INTASAT-1

S/C#3
AMSAT-OSCAR-7



* The Change in Attitude of ITOS Project Management

1972 Vandenberg Air Force Base

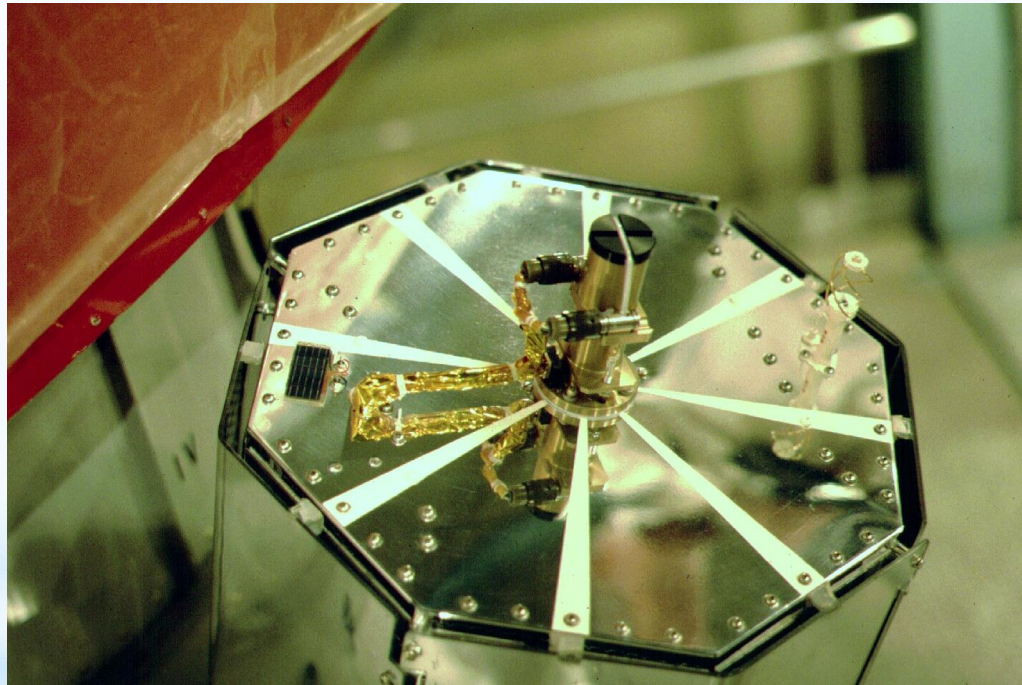


Bill Jones the ITOS Project Manager when AO-5 was launched, left GSFC in 1971. He was replaced by [Jerry Beckford](#), seen here inspecting AO-6 along with a Technician from the ITOS program. He wasn't too happy about a mechanical fix we'd made late in the AO-6 program. But he let us fly. It was indeed, his decision. Perry looks a little nervous here.

* The Change in Attitude of ITOS Project Management (2)

For AO-7 we had more Acceptance from ITOS but Jerry made us Test the Heck out of that Spacecraft. As we all know, that paid off big time for AMSAT. AO-7 outlived ITOS-7 by 40 years....so far (and counting!)

VAFB
SLC-2W



*Level 5
S/C Integration.*

*It doesn't get
better than this.*

Just before the L/V Fairing was put on, Jerry approached me on the 5th Level of the Gantry (as seen here) and said, “King, that’s a mighty nice spacecraft you’ve got there. I hope it works well.” ... Times change.

Two months later Jerry became a radio amateur and jointed AMSAT – a true story.

* *In All Seriousness:*



Could Things Have Gone Differently Back Then? What IF...?

* Check This Out:

$\Delta T =$
78 Days



Mission:	Launch Date:
Apollo 11	July 16, 1969
Apollo 12	November 14, 1969
Tiros-M/AO-5	January 23, 1970
Apollo 13	April 11, 1970

- The NASA Administrator's primary job wasn't just approving Australis-OSCAR-A (5) to Fly as a Secondary on a New Meteorological Mission. He was pretty busy keeping the Apollo Program on Schedule...and, being Responsive to the President of the U.S. at a Critical Time in the Cold War.
- What if the new TIROS-M, a proto-flight spacecraft and first-of-a kind, had run into technical difficulties of any kind and had "slipped" it's launch date by maybe just 3 months? Such things occurred regularly back then and even now!



* What then the Fate of AO-5? And of AMSAT?

- * What if the Decision Dr. Paine had to make in order to Include Australis on TIROS-M, had been made in mid-April 1970 instead of in the Fall of 1969 as it was?
- * Would he have been inclined to take the same risk again, under these circumstances?
- * Would he have opted to minimize his overall launch risks, given the failure of Apollo-13?
- * What would have happened to AO-5?
- * What would have been AMSAT's future given a precedent for not launching secondary satellites due to their incremental risk potential?
- * What would have been the consequences of that decision for all Small Satellites today?